

What Is Claimed Is:

1. A control system for an automotive vehicle having a wheel and wheel brake comprising:

a wheel speed sensor generating a rotational speed signal; and

5 a controller coupled to the wheel speed sensor, said controller determining a vehicle speed, calculating wheel slip based upon the vehicle speed and the rotational speed, estimating a normal force on the wheel, calculating a modified brake torque signal
10 in response to the wheel slip and the normal force, and actuating the wheel brake in response to the modified brake torque signal.

2. A system as recited in claim 1 further comprising a vehicle speed sensor, said controller
15 determining vehicle speed from the vehicle speed sensor.

3. A system as recited in claim 2 wherein the vehicle speed sensor comprises plurality of wheel speed sensors.

20 4. A system as recited in claim 1 wherein said controller estimates a wheel slip and a slip angle threshold and calculates the brake torque signal in response to the wheel slip, the normal force and the slip angle threshold.

25 5. A system as recited in claim 1 wherein said controller measures a wheel deceleration from the wheel speed sensor; when the wheel deceleration is above a threshold applying the modified torque.

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6. A system as recited in claim 5 wherein said controller applies an unmodified torque when the wheel deceleration is below a threshold.

7. A method of controlling a vehicle
5 having a wheel and wheel brake comprising:
measuring rotational speed of a wheel;
determining a vehicle speed;
calculating wheel slip based upon the
vehicle speed and the rotational speed;
10 estimating a normal force on the wheel;
calculating a modified brake torque signal
in response to the wheel slip and the normal force;
and
actuating the wheel brake in response to the
15 modified brake torque signal.

8. A method as recited in claim 7 further comprising estimating a slip angle threshold and wherein calculating the brake torque signal in response to the wheel slip, the normal force and the
20 slip angle threshold.

9. A method as recited in claim 7 further comprising measuring a wheel deceleration; when the wheel deceleration is above a threshold applying a modified brake torque.

25 10. A method as recited in claim 9 further comprising applying an unmodified torque when the wheel deceleration is below a threshold.

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11. A method as recited in claim 7 further comprising when the vehicle speed is above a speed threshold, performing calculating wheel slip based upon the vehicle speed and the rotational speed, 5 estimating a normal force on the wheel, calculating a modified brake torque signal in response to the wheel slip and the normal force, and actuating the wheel brake in response to the modified brake torque signal when a wheel deceleration is below a threshold.

10 12. A method as recited in claim 7 wherein calculating wheel slip comprises calculating a normalized wheel slip value.

13. A method as recited in claim 7 wherein determining a vehicle speed comprises determining a 15 vehicle speed in response to the wheel speed.

14. A method of controlling braking of an automotive vehicle having a plurality of wheels and brakes comprising:

20 measuring rotational speed of the plurality of wheels;

determining a vehicle speed;

calculating respective wheel slip for the plurality of wheels based upon the vehicle speed and a respective rotational speed;

25 estimating a normal force on the plurality of wheels;

calculating a respective modified brake torque signal in response to the wheel slip and the normal force for each of the plurality of wheels; and

actuating a respective brake in response to the respective modified brake torque signal.

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5 15. A method as recited in claim 14 further comprising estimating a slip angle threshold and wherein calculating a respective modified brake torque signal comprises calculating a respective modified brake torque signal in response to the wheel slip, the normal force and the slip angle threshold.

10 16. A method as recited in claim 14 further comprising measuring a wheel deceleration; when the wheel deceleration is above a threshold applying the respective modified torque, and applying an unmodified torque when a wheel deceleration is below a threshold.

15 17. A method as recited in claim 14 wherein calculating a respective wheel slip comprises calculating a respective normalized wheel slip value.

18. A method as recited in claim 14 wherein determining a vehicle speed comprises determining a vehicle speed in response to the wheel speed.